Section II. (Amendments to the Claims)

Claims 1-34, 36-43, and 45-50 have been amended, and new claims 51-52 have been added, as follows:

1. (Currently amended) A wafer susceptor for use in a substrate processing system, comprising:

at least one recess formed therein, ~~with~~ wherein each recess is arranged and configured to hold ~~at least~~ one substrate therein, wherein said at least one substrate comprises material selected from the group consisting of silicon, gallium nitride, and aluminum nitride, and wherein ~~a combination of said wafer holder and said at least one substrate forms a composite substrate having uniform processing characteristics~~ said water susceptor is characterized by physical properties that match those of the substrates held therein.

2. (Currently amended) The wafer susceptor of Claim 1, wherein said ~~uniform processing characteristics of said composite substrate are achieved by matching physical properties of said wafer susceptor and said substrates~~ at least one substrate comprises silicon.

3. (Currently Amended) The wafer susceptor of Claim ~~2~~ 1, wherein said physical properties comprise ~~at least one property selected from the group consisting of~~:

Thermal coefficient of expansion;

Reflectivity;

Thermal mass;

Thermal conductivity;

Electrical resistivity;

Dielectric constant;

Dielectric loss;

Density;

Hardness; and

Emissivity.

4. (Currently amended) ~~The system of~~ A substrate processing system comprising at least one wafer susceptor as in claim ~~5~~ 1, wherein said system further ~~comprising~~ comprises an automated substrate transport assembly arranged for ~~serially~~ transporting ~~single ones of a plurality of~~ substrates into and out of ~~the~~ a deposition chamber in which said wafer susceptor is disposed.

A1

5. (Currently amended) The substrate processing system of claim ~~5~~ 4, ~~further comprising an~~ wherein said automated substrate transport assembly is arranged for serially transporting single ones of a plurality of substrates into and out of said deposition chamber.

6. (Currently amended) The substrate processing system of claim ~~7~~ 4, further comprising a substrate cassette for storage and bulk transport of plural arrays of substrates, and ~~position able~~ said substrate cassette is positioned in substrate pickup and substrate delivery relationship to the automated substrate transport assembly.

7. (Currently amended) The substrate processing system of claim ~~8~~ 6, ~~further comprising an~~ wherein said automated substrate transport assembly ~~including~~ comprises a wand array

comprising a plurality of wands constructed and arranged to simultaneously transport a corresponding plurality of substrates into and out of the deposition chamber, wherein the automated substrate transport assembly and the substrate cassette are constructed and arranged so that when the automated substrate transport assembly is translated into a pickup position relative to the substrate cassette, said plurality of wands engage and extract a plurality of substrates from the substrate cassette, with each wand engaging and extracting a substrate from a different one of said plural arrays of substrates, and so that when the automated substrate transport assembly is translated into a deposit position relative to the substrate cassette, said plurality of wands release and deposit a plurality of substrates on the substrate cassette, with each wand releasing and depositing a substrate into a different one of said plural arrays of substrates.

8. (Currently amended) The substrate processing system of claim ~~5~~ 4, ~~further comprising an~~ wherein said automated substrate transport assembly ~~including~~ comprises a double-sided wand array comprising a plurality of wands constructed and arranged to simultaneously transport a corresponding plurality of substrates into and out of the deposition chamber.

9. (Currently amended) The substrate processing system of claim ~~5~~ 4, further comprising a loadlock chamber~~, and a windless automated substrate transport assembly~~ including a multiparted substrate cassette therein, and a transport arm arranged to selectively engage said multiparted substrate cassette and disengage from said multiparted substrate cassette in the loadlock chamber.

10. (Currently amended) ~~The system of claim 5, further~~ A substrate processing system comprising at least two wafer holders as in claim 1, an etch chamber for regeneration of ~~a wafer~~ wafer holders, ~~at least two wafer holders~~ and an automated ~~substrate~~ transport

assembly arranged to (1) introduce one of said at least two wafer holders into ~~the reactor~~ a deposition chamber, while another of said at least two wafer holders is disposed in said etch chamber and regenerated thereby, and (2) ~~to~~ thereafter extract said at least two wafer holders respectively from the ~~reactor~~ deposition chamber and etch chamber, followed by introduction of one of said at least two wafer holders ~~the wafer holder from~~ into the etch chamber ~~into the reactor~~ from the deposition chamber, and introduction of another of said at least two wafer holders ~~the wafer holder from~~ into the ~~reactor into~~ deposition chamber from the etch chamber.

11. (Currently amended) The substrate processing system of claim ~~5~~ 10, wherein at least one of the wafer ~~holder~~ holders has two recesses therein.

12. (Currently amended) The substrate processing system of claim ~~5~~ 10, wherein at least one of the wafer ~~holder~~ holders has four recesses therein.

13. (Currently amended) The substrate processing system of claim ~~5~~ 10, wherein at least one of the wafer ~~holder~~ holders a diameter in the range of from about 200mm to about 350mm.

14. (Currently amended) The substrate processing system of claim ~~5~~ 10, wherein at least one of the wafer ~~holder~~ holders has a diameter in the range of from about 200mm to about 300mm.

15. (Currently amended) The substrate processing system of claim ~~5~~ 10, wherein each of the wafer holders comprises ~~wafer holder~~ recesses ~~has~~ having a diameter in the range of from about 100mm to about 150mm.

16. (Currently amended) The substrate processing system of claim ~~5~~ 10, wherein each of the wafer holders comprises ~~wafer holder~~ recesses ~~has~~ having a diameter in the range of from about 100mm to about 125mm.

17. (Currently amended) The substrate processing system of claim ~~5~~ 10, further comprising a substrate cassette including slot members for positioning substrates in plural arrays, and wherein successive arrays are in side-by-side relationship to one another.

18. (Currently amended) The substrate processing system of claim ~~19~~ 17, wherein the substrate cassette is constructed and arranged for holding two arrays of substrates, wherein all substrates are planar and each respective substrate in a first array is generally coplanar with a corresponding respective substrate in a second array.

19. (Currently amended) The substrate processing system of claim ~~20~~ 18, wherein the first and second arrays are parallel to one another.

20. (Currently amended) The substrate processing system of claim ~~5~~ 10, further comprising an automated substrate transport assembly and a substrate cassette, wherein the ~~substrate holder~~ wafer holders, the automated substrate transport assembly, and the substrate cassette are constructed and arranged to simultaneously process two substrates.

21. (Currently amended) The substrate processing system of claim ~~5~~ 10, ~~wherein the reactor comprises~~ comprising a single wafer deposition chamber sized for processing single substrates having a 200mm diameter.

22. (Currently amended) The substrate processing system of claim ~~5~~ 21, wherein ~~the plurality~~

~~of recesses formed in the~~ each wafer holder ~~are~~ is arranged and configured for placement inside said single wafer deposition chamber, and each wafer holder comprises a plurality of recesses for holding ~~to hold~~ substrates having a 100mm diameter.

23. (Currently amended) The substrate processing system of claim ~~5~~ 22, wherein each of the recesses ~~formed~~ in ~~the~~ each wafer holder is circular.

24. (Currently amended) The substrate processing system of claim ~~5~~ 20, further comprising a processor for programmable operating the automated substrate transport assembly according to a cycle time program.

25. (Currently amended) A method ~~of~~ for increasing the throughput of a single substrate deposition chamber, said method comprising:

positioning in said single substrate deposition chamber a wafer susceptor having at least one recess formed therein, with each recess being arranged and configured to hold ~~at least~~ one substrate therein, wherein said at least one substrate comprises material selected from the group consisting of silicon, gallium nitride, and aluminum nitride, and wherein ~~a combination of said wafer holder and said at least one substrate forms a composite substrate having uniform processing characteristics~~ said water susceptor is characterized by physical properties that match those of the at least one substrate held therein.

26. (Currently amended) The method of Claim 25, wherein said ~~uniform processing characteristics of said composite substrate are achieved by matching physical properties of said wafer susceptor and said substrates~~ at least one substrate comprises silicon.

27. (Currently amended) The method of Claim ~~26~~ 25, wherein said physical properties comprise ~~at least one property selected from the group consisting~~:

thermal coefficient of expansion;

reflectivity;

thermal mass;

thermal conductivity;

electrical resistivity;

dielectric constant;

dielectric loss;

density;

hardness; and

emissivity.

28. (Currently amended) The method of claim ~~27~~ 25, further comprising providing an automated substrate transport assembly including a wand array comprising a plurality of wands constructed and arranged to simultaneously transport a corresponding plurality of substrates into and out of the single substrate deposition chamber.

29. (Currently amended) The method of claim ~~27~~ 25, further comprising providing an automated substrate transport assembly arranged for serially transporting single ones of a plurality of substrates into and out of said single substrate deposition chamber.

30. (Currently amended) The method of claim ~~27~~ 25, further comprising providing an automated substrate transport assembly for transporting substrates into and out of said single substrate deposition chamber.

31. (Currently amended) The method of claim 30, further comprising providing a substrate cassette for storage and bulk transport of plural arrays of substrates, wherein the cassette is ~~position able~~ positionable in substrate pickup and substrate delivery relationship to the automated substrate transport assembly.

32. (Currently amended) The method of claim 31, ~~further comprising providing an~~ wherein said automated substrate transport assembly ~~including~~ comprises a wand array comprising a plurality of wands constructed and arranged to simultaneously transport a corresponding plurality of ~~substrate~~ substrates into and out of the single substrate deposition chamber, ~~wherein the substrate cassette contains plural arrays of substrates, and positioning the substrate cassette in substrate pickup and substrate delivery relationship to the automated substrate transport assembly; and operating the semiconductor processing system by:~~

~~translating the~~ wherein said automated substrate transport assembly is first translated into a pickup position relative to the substrate cassette, so that the plurality of wands of said automated substrate transport assembly engage and extract a plurality of substrates from the substrate cassette, with each wand engaging and extracting a substrate from a different one of the plural arrays of substrates in said substrate cassette;

~~translating the~~ wherein said automated substrate transport assembly ~~carrying~~ subsequently carries the engaged and extracted substrates to the single substrate

deposition chamber and ~~releasing~~ releases the substrates into respective recesses in the wafer holder;

after deposition of ~~depositing~~ thin film material on the substrates in the single substrate deposition chamber, ~~to yield~~ yielding coated substrates~~;~~, ~~translating~~ the automated substrate transport assembly ~~into the deposition chamber after the depositing step is completed and extracting~~ extracts the coated substrates from the respective recesses in the wafer susceptor~~;~~,

~~translating the automated substrate transport assembly carrying~~ carries the extracted coated substrates ~~into a deposit position relative to said substrate cassette or a second substrate cassette~~, and ~~releasing~~ releases the coated substrates to said substrate cassette or a second substrate cassette~~;~~

~~whereby the throughput of the semiconductor processing system is increased relative to serial transport and processing of individual substrates~~.

33. (Currently amended) The method of claim ~~27~~ 25, comprising using a double-sided wand assembly comprising a plurality of wands and arranged to simultaneously transport a corresponding plurality of substrates into and out of the single substrate deposition chamber.

34. (Currently amended) The method of claim ~~27~~ 25, comprising sequentially using multiple wafer holders, by ~~including~~ positioning one of the multiple ~~wafter~~ wafer holders in the single substrate deposition chamber for processing of wafers thereon, and concurrently regenerating another of said ~~wafter~~ multiple wafer holders after it has been in the single

substrate deposition chamber during processing of wafers thereon.

35. (Original) The method of claim 34, wherein said regenerating comprises etch processing of said another of said wafer holders.

36. (Currently amended) The method of claim ~~27~~ 25, wherein the wafer holder has two recesses therein.

37. (Currently amended) The method of claim ~~27~~ 25, wherein the wafer holder has four recesses therein.

38. (Currently amended) The method of claim ~~27~~ 25, wherein the wafer holder has a diameter in the range of from about 200 mm to about 350 mm.

39. (Currently amended) The method of claim ~~27~~ 25, wherein the ~~wafter~~ wafer holder has a diameter in the range of from about 200 mm to about 300mm.

40. (Currently amended) The method of claim ~~27~~ 38, wherein each of the ~~wafer holder~~ recesses in said wafer holder has a diameter in the range of from about 100mm to about 150mm.

41. (Currently amended) The method of claim ~~27~~ 38, wherein each of the ~~wafer holder~~ recesses in said wafer holder has a diameter in the range of from about 100mm to about 125mm.

42. (Currently amended) The method of claim ~~27~~ 25, further comprising providing a

substrate cassette including slot members for positioning substrates in plural arrays, and wherein successive arrays are in side-by-side relationship to one another.

43. (Currently amended) The method of claim ~~27~~ 25, further comprising providing a substrate cassette that is constructed and arranged for holding two arrays of substrates, wherein all substrates are planar and each respective substrate in a first array is generally coplanar with a corresponding respective substrate in a second array.

44. (Original) The method of claim 43, wherein the first and second arrays are parallel to one another.

45. (Currently amended) The method of claim ~~27~~ 25, further comprising providing an automated substrate transport assembly and a substrate cassette, wherein the ~~substrate holder~~ single substrate deposition chamber, the automated substrate transport assembly, and the substrate cassette are constructed and arranged to simultaneously process two substrates.

46. (Currently amended) The method of claim ~~27~~ 25, wherein the ~~reactor comprises a~~ single wafer deposition chamber is sized for processing single substrates having a 200mm diameter.

47. (Currently amended) The method of claim ~~27~~ 46, wherein ~~the plurality of recesses formed in~~ the wafer holder ~~are~~ comprises a plurality of recesses arranged and configured to hold substrates having a 100mm diameter.

48. (Currently amended) The method of claim ~~27~~ 47, wherein each of the recesses ~~formed in~~

~~the wafer holder~~ is circular.

49. (Currently amended) The method of claim ~~27~~ 25, further comprising providing an automated substrate transport assembly for transporting substrates into and out of the single substrate deposition chamber, and programmably operating the automated substrate transport assembly according to a cycle time program.

50. (Currently amended) ~~The~~ A wafer susceptor ~~of claim 7, wherein said wafer susceptor is~~ used in a semiconductor substrate processing system, comprising ~~a reactor having at least one single substrate deposition chambers, and further comprising an automated substrate transport assembly including a wand array comprising a plurality of wands constructed and arranged to simultaneously transport a corresponding plurality of substrates into and out of the deposition chamber~~ at least one recess formed therein, wherein each recess is arranged and configured to hold one semiconductor substrate therein, wherein said at least one semiconductor substrate comprises material selected from the group consisting of silicon, gallium nitride, aluminum nitride, diamond, gallium arsenide, indium nitride, indium phosphide, and gallium phosphide, wherein said wafer susceptor is characterized by physical properties that match those of the semiconductor substrates held therein.

51. (New) A wafer susceptor arranged and configured for placement in a single substrate deposition chamber, wherein said wafer susceptor is substantially circular in shape and comprises two or more recesses formed therein, wherein each recess is arranged and configured to hold one substrate, and wherein said water susceptor is characterized by physical properties that match those of the substrates held therein.

52. (New) The wafer susceptor of claim 51, wherein the substrates comprise material

selected from the group consisting of silicon, GaN, SiC, and AlN.